



A Survey on Coin Detection Using Deep Learning

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ABSTRACT:

In the digital age, currency remains an essential form of transaction. One crucial aspect of maintaining currency integrity is to accurately detect counterfeit notes. The current system for detecting counterfeit currency relies heavily on manual inspection and identification by trained professionals. However, this approach is time-consuming and labor-intensive, resulting in significant delays in currency clearance and transactions.

This study presents a solution to this problem using deep learning, specifically Convolutional Neural Networks (CNNs). By utilizing an automated currency detection system, banks and financial institutions can expedite the process of detecting and eliminating counterfeit notes, ensuring a more efficient and accurate currency transaction system.

KEYWORDS: Counterfeit detection, deep learning, Convolutional Neural Networks, CNNs, automated detection, efficiency, accuracy.

Introduction

More than half of the global population is currently interconnected online, primarily through diverse channels, with social media emerging as the predominant platform. Social media is a cornerstone of daily life, facilitating instantaneous worldwide communication, seamless information sharing, and valuable feedback. It offers a distinctive avenue for presenting perspectives to a vast global audience.

Considerable research efforts have been dedicated to exploring the integration of advanced technology for coin detection through deep learning methodologies. The focus revolves around optimizing usability and value in the context of coin recognition systems. Special consideration is given to ensuring these technologies accommodate individuals facing challenges in coin identification.

In this scenario, our initiative centers around leveraging cutting-edge technology to streamline the detection and resolution of coin-related concerns on a global scale. Our application serves as an inventive interface, enabling users to seamlessly capture and document coin-related issues through photos. Users can precisely pinpoint the location of the concern and provide a comprehensive description. By tagging the relevant coin identification authority, a direct connection is established between individuals and officials.

This proactive approach empowers users to endorse valid coin-related issues, fostering a constructive discussion for consideration and swift resolution by the coin identification authority. The application facilitates real-time feedback, where successful resolution is marked by a distinctive symbol, instilling confidence in users that their coin-related concerns have been effectively addressed. This approach not only enhances public engagement but also establishes a responsive and efficient system for global coin management.

A. Motivation of the Project

In the field of coin detection using deep learning, our project aims to enhance the identification and verification of coins through advanced technology, acknowledging the critical role of accurate coin recognition in various applications. Similar to city governance, our Coin Identification System (CIS) endeavors to streamline the coin identification process, ensuring legitimacy and facilitating seamless transactions. To address discrepancies efficiently, our user-friendly mobile application empowers individuals to report coin-related concerns at any time, fostering a harmonious relationship between the public and the coin identification system. This accessibility not only provides a convenient platform for users but also contributes to overall improvements in coin identification accuracy, bridging the gap between technology and public engagement. Between technology and public engagement, fostering a more responsive and effective coin management system.

B. Brief description

Coin detection using deep learning involves training a neural network to recognize and classify different coins within images. This process typically includes collecting a diverse dataset of coin images, annotating them with corresponding labels, and then using a deep learning model, such as a Convolutional Neural Network (CNN), to learn the features and patterns associated with various coins. The trained model can then accurately identify and classify coins in new images, making it a valuable tool for applications like automated coin counting or sorting in financial systems.

Literature Survey

In the realm of coin detection using deep learning, the literature survey delves into studies focusing on enhancing the usability and authentication of coins through advanced technology. The Pune Coin Identification System (PCIS) emerges as a crucial initiative, mirroring the responsibilities of a municipal corporation, by streamlining coin identification processes, ensuring legitimacy, and facilitating seamless transactions.

Sunil Kumar Kopparapu's work on a Natural Language Mobile Interface for registering citizen complaints [1] provides insights into accessible platforms for public interaction, underscoring the importance of efficient grievance filing with municipal corporations.

Minh Tien Le's exploration of React Native in social media platform development [2] highlights the versatility of React for cross-platform applications, showcasing its relevance in creating innovative interfaces.

The "All Indian Grievance Redressal App" [3] simplifies the complaint filing process using Java and XML, emphasizing user-friendly interfaces crucial for effective public engagement.

The "Grievance Reporting System" [4] by Pillai College of Engineering students utilizes machine learning in an Android application to assess the severity of reported issues, showcasing a proactive approach to enhance grievance registration efficiency.

Xingwei Zhou, Wenshan Hu, and Guo-Ping Liu's study on React Native in online experimentation [5] demonstrates its potential for educational purposes. Additionally, Mahvash Momin, Sadiya Ansari, Abbas Damarwala, and Sanam Kazi's proposal of a Smart E-Grievance System [6] underscores the importance of expediting citizen opinions in smart cities.

Disaster management applications using React Native and TensorFlow [7] emphasize the critical role of technology in crisis situations. The Medikyte app's development with React Native [8] showcases its practical application in the healthcare sector.

The "CitizenApp" [9] details the creation of a citizen reporting app for public facility monitoring, highlighting the significance of integrated smart city applications. Lastly, the "Road Care Mobile Application" [10] by students at University Sultan Zainal Abidin emphasizes the practicality of mobile applications in addressing road problems and facilitating timely repairs, aligning with the theme of coin detection using deep learning.

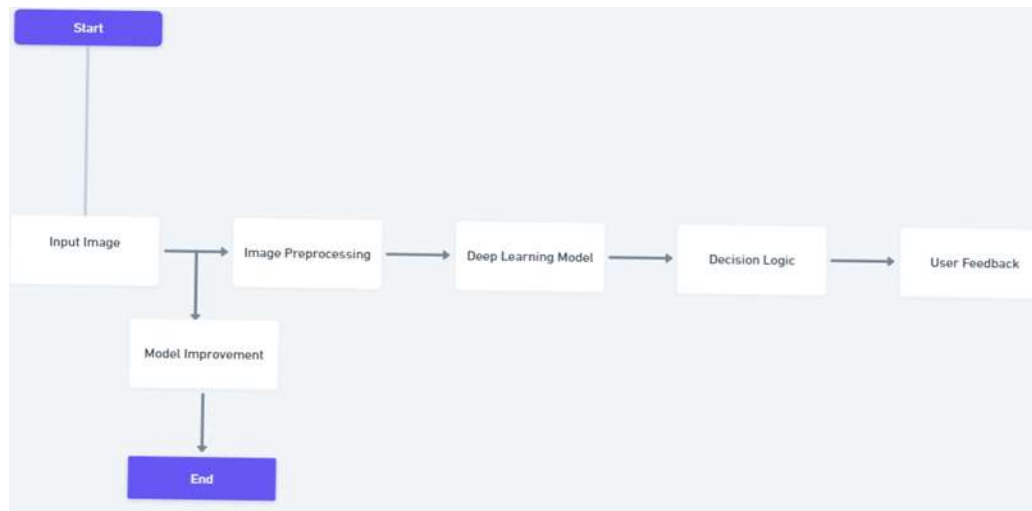
Problem Statement

As the landscape of coin circulation undergoes changes, various challenges arise in the domain of coin detection using deep learning. Issues such as accurate identification, authentication, and seamless integration of coins into various systems become critical. The evolution in coin usage necessitates an efficient system that addresses concerns related to coin legitimacy, preventing counterfeit coins from circulating in financial transactions.

To tackle these challenges, the project aims to establish a comprehensive system that allows users to engage in discussions about coin-related issues. Leveraging the significance of social media, the system will serve as a platform for individuals worldwide to share information, provide feedback, and contribute to the discourse on coin detection using deep learning. The goal is to create a responsive framework that benefits both the users, by addressing their concerns, and the coin detection system, by enhancing its accuracy and efficiency in identifying legitimate coins.

Proposed Algorithm

The term "application" (shortened as "app") refers to software designed for installation and execution on electronic devices such as computers, tablets, or smartphones. The most common usage of the term "app" pertains to software downloaded and utilized on mobile devices. Apps typically serve a specific, focused function, and each mobile app is characterized by a unique design and data flow tailored to its specific objectives and tasks. In the context of coin detection using deep learning, our proposed algorithm encompasses a straightforward yet highly efficient design and data flow.



Start: The coin detection process initiates with the collection of raw images representing various coins.

Input Image: Raw images of coins are supplied as input data for the coin detection system. **Image Preprocessing:** The input coin images undergo preprocessing techniques to enhance their quality and prepare them for further analysis.

Deep Learning Model: Processed coin images are then fed into the deep learning model specialized in coin detection and authentication.

Decision Logic: The deep learning model generates predictions regarding the authenticity of the coins, and a decision logic component assesses these predictions to determine the final authenticity status.

User Feedback: Users provide feedback based on their assessment of the system's accuracy in detecting and authenticating coins.

Model Improvement: The feedback received from users is utilized to iteratively enhance the performance and accuracy of the deep learning model for continuous improvement.

End: The coin detection process concludes, and the system remains ready for subsequent coin authenticity assessments.

Conclusion

In conclusion, our proposed 24/7 accessible application for coin detection, built on Microsoft SQL Server and React JS, hosted on Azure, and developed with React Native, offers a seamless platform for users interested in coin authentication through deep learning. This innovative app facilitates transparent communication between coin enthusiasts and relevant authorities, allowing users to submit concerns, engage with similar issues, and express opinions through interactive features. By bridging the gap between the public and the coin authentication system, the app ensures efficient responses to coin-related challenges and ongoing improvement based on user feedback, contributing to a dynamic and responsive ecosystem for coin detection.

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